Improving Decision Support
During High Impact Events
Using
Mobile Communications

Are You Ready for the Mobile Web?

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Government Web Managers Conference
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Agenda

- Business Case for Mobile Web
- Compare Mobile Web with Mobile Web 2.0

- InteractiveNWS (iNWS) Prototype
  - Background
  - iNWS Demo

- Mobile Vision
- Future Plans
- Lessons Learned

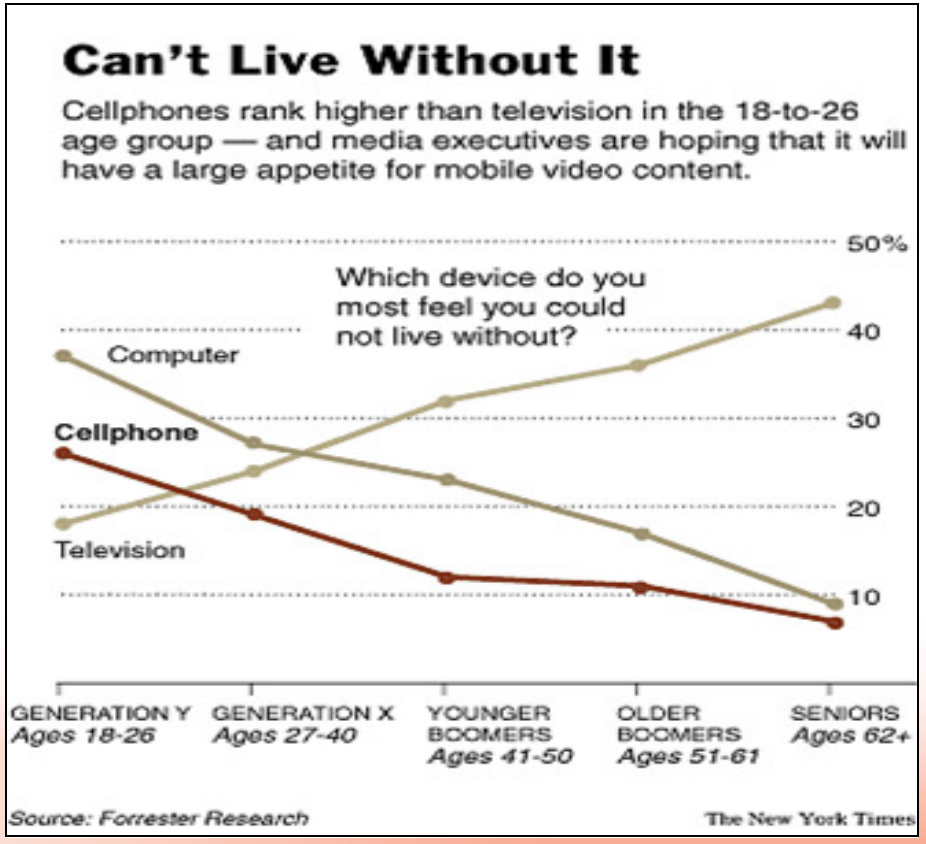
Business Case for Mobile Web

- U.S. wireless penetration now at 89.5% of the population (262 Million as of February 2009)

For January – June 2008:

- Wireless <u>data</u> revenue up 40% to $14.8 billion

- Data = 20% of all US wireless service



A Look at the Next Generation

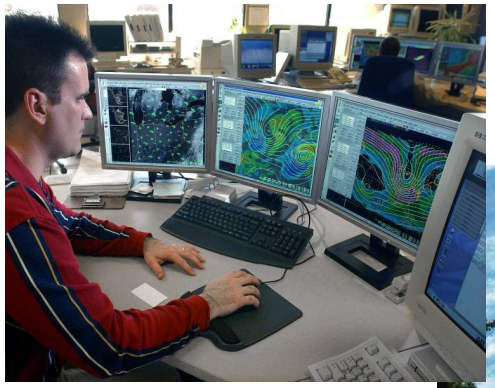
Survey Responses of US teens 13-19 (September 2008)

- 57% agree or somewhat agree that the cell phone has improved their quality of life
- 41% are concerned about privacy and security issues when using mobile phones
- 57% of Smartphone users and 29% of regular cell phone users said they carry their cell phone because it is how they stay connected to their "world"
- Overall a teenager's cell phone ranked 2nd only to clothing in determining their social status
- 42% of teenagers said they could text message blindfolded!
- The #1 reason why teens liked text messaging was because it allowed them to multitask
- 66% want cell phones to provide the freedom to get an education from any location on earth
- 28% of teens are browsing the web on their cell phones
- 59% of teens are willing to provide their profile information to businesses that advertise on cell phones!
- 46% of children 8-12 years old own a phone

From Toy to Tool, www.cellphonesinlearning.com

Why is this important to the NWS?

- NOAA needs to remain relevant in today's mobile info society
- Society has a need for instant access and sharing of information ***anytime and anywhere***
- NWS is evolving from a dissemination paradigm (i.e. one way transmission of products and data) to a ***2-way real-time interactive and collaborative environment***
- Many of our core partners have already adopted emerging consumer communication technologies and applications
- Customer centric approach where users can control the information they receive – keeps office workload to a minimum



"The fact is, NWS services – principally direct interaction with decision makers – are in greater demand than at any time in our nearly 140-year history."

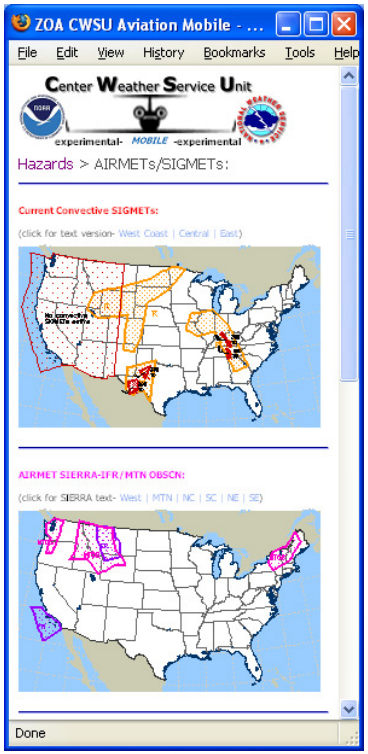
Jack Hayes, NWS Director 2008

Mobile Web

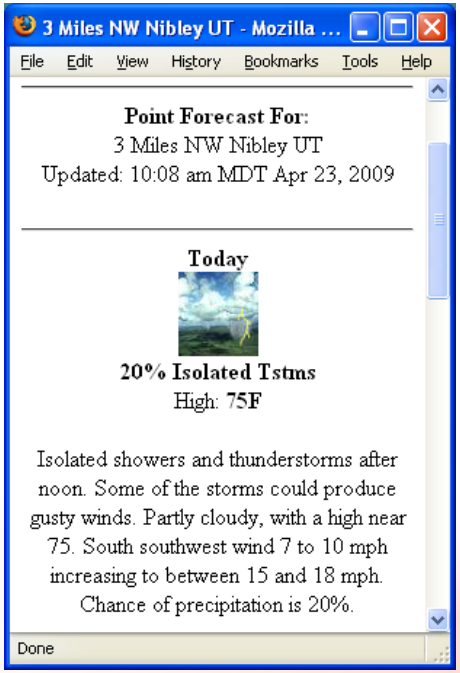
- **Wikipedia defines this as…**

"Access to browser-based web services such as the World Wide Web using a mobile device such as cell phones or PDAs"

- Web-on-a-phone (*not* very innovative)
- Requires some content changes for small screens
- Many mobile browsers are smart enough to adapt content to fit the screen

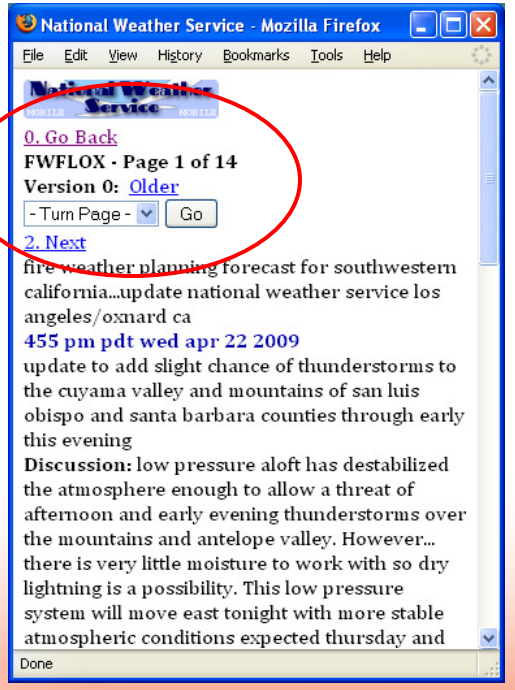


www.wrh.noaa.gov/zoa/MOBILE



mobile.wrh.noaa.gov

(ouch)



Mobile Web via 2.0

- **Wikipedia defines Web 2.0 as…**

  "A second generation of web development and design, that facilitates communication, secure information sharing, interoperability, and collaboration on the World Wide Web."

*"Web 2.0 is the **business revolution** in the computer industry caused by the move to the **Internet as a platform**, and an attempt to understand the rules for success on that new platform."*

Tim O'Reilly "Web 2.0 Compact Definition: Trying Again"

Imagine having your cell phone…

- Wake you at 2:00 AM for a tornado on your street

- Warn you of a thunderstorm moving towards soccer practice across town

- Advise you of a critical change in the wind that will blow a toxic-spill plume in your path as you travel down the highway on vacation

… now ***that's*** innovative. That's Mobile Web 2.0!

Interactive NWS (iNWS) Prototype

***iNWS** mobile services are designed to bring critical weather data and automatic alerts directly to your cell phone or mobile device*

http://inws.wrh.noaa.gov

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iNWS Background

Objectives

- Develop the ability to reach decision makers anytime, anywhere
- Not just “Web-on-a-phone”
- End user should drive content

- Intuitive Interface - Eliminate NWS jargon (WFO, CWA, PILs)
- Utilize simple, well known communication protocols (eg, SMS)
- Use open source software and open standards wherever possible

- Make it robust, scalable, and easy to support
- Provide a variety of client applications for managing user profiles

Challenges

Mission, Money, Manpower

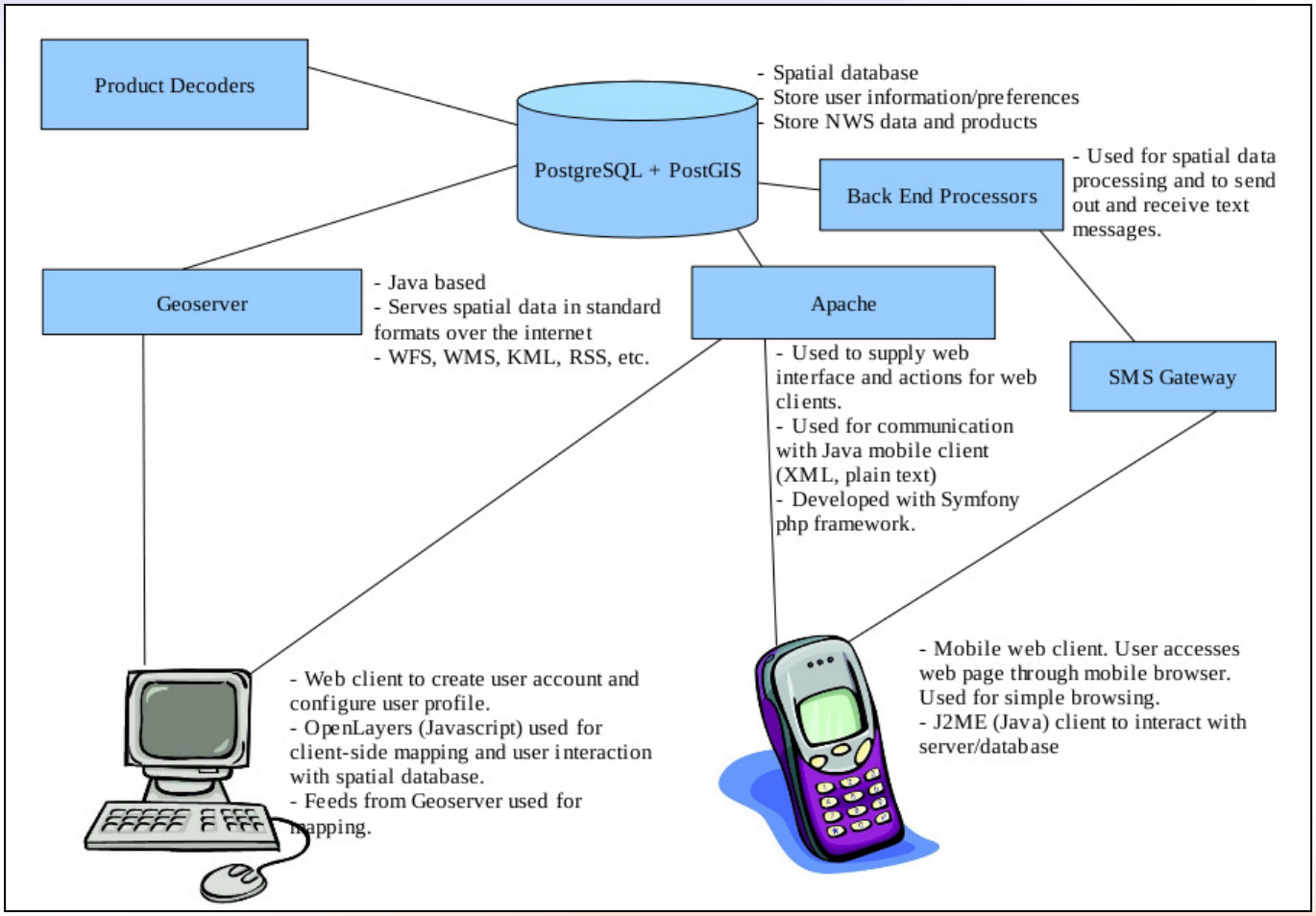
- Who are our *real* customers, and what do they need?
- How to integrate with commercial and other Gov't mobile Wx services?

- Do we need to partner with Cell Service Providers?
- What mobile platforms should we support? and what does it cost to become a vendor-licensed mobile app developer?

- Can we make user of the Locator API or GPS?
- How to support low-end / mid-range / and "smart-phone" devices?
- NOAA's Blackberry Enterprise Server

- Scale: During active weather (i.e. hurricanes) we receive 300-500M web hits per day
- Many mobile users require Level-One support

System Architecture



iNWS Web 2.0 Features

- **Interactive User Participation**
  - Users manage their own accounts and Weather Alert profiles
  - Users decide alert types, format, geography and scope
- **Dynamic Content / Device Independence**
  - Content is unique and dynamic for EACH USER
  - Users can manage content from a cell phone or web page
- **Web Standards**
  - Such as WMS, Javascript, Java, OCG, Apache, PHP
- **Scalability**
  - Utilizes existing Cellular/Internet provider infrastructure
  - Easy to add modular features, products, and servers

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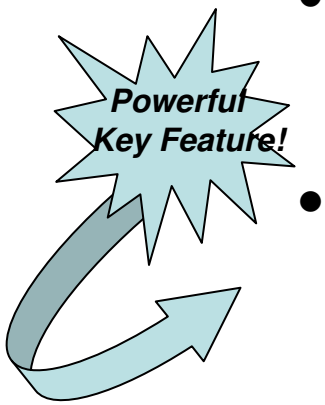
Web 2.0 aims to enhance creativity, communications, secure information sharing, collaboration and functionality.

iNWS Suite of Services

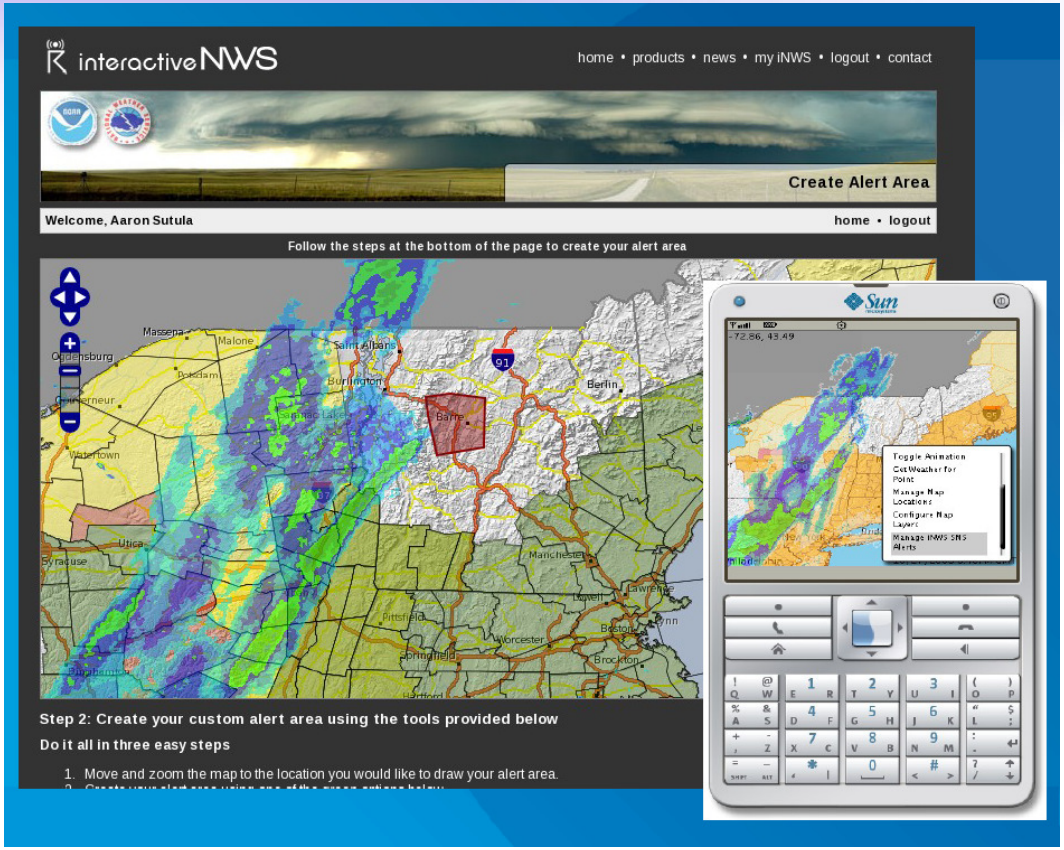
- **iNWS Alerts** – Text based alerts of NWS watches, warnings, and advisories using SMS and email
- **iNWS Mobile** – Mobile Java application for browsing weather data, and configuring iNWS Alerts



- **NWSChat* to SMS** – Adds ability for NWS to send text messages to mobile users from chat rooms
- **iNWS Mobile Web** – Weather data formatted for mobile phone web browsers
- **iCWSU** – Aviation weather data formatted for mobile phone web browsers

* See NWSChat.weather.gov

iNWS Demo



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SMS Technology

Short Message Service – Text Messaging

- We use an 'SMS Broker' as middle-man from NWS to Cellular Service providers
  - Advantages:
    - Increased reliability
    - Our "campaign" has been approved by all major cell providers*
  - Disadvantages:
    - Not all small providers are supported
    - Cost = $25K for 350K SMS/year
    - Does not support "Reverse 911" functionality

- SMS = 160 character limit  Tiny URL-like solution!
- Limits to the number of SMS that can be transmitted at one time, and cell bandwidth
  - Optimization via multiplexing, and SMS prioritization helps
  - Cell Broadcast technology will address this issue
    - Still many years away
    - Will third parties be able to utilize Cell Broadcast?

*A campaign is a term used by SMS Brokers to designate customer SMS projects linked to a specific service contract

iNWS Mobile Vision

Four-pronged approach

- **NWS mobile alerts**
  - Target Audience – Community leaders and decision makers
  - Alert types – Sub-catastrophic, 'usual' watch/warning/advisory for moderate to high impact weather that is important to an emergency manager, for example.
- **DHS/FEMA IPAWS Commercial Mobile Alert System**
  - Target audience – General Public
  - Alert types – Catastrophic – used only rarely for major events
  - "Reverse 911"; cell broadcast still years away
- **Private Sector**
  - Target audience – General public, businesses
  - Alert types – Value-added and custom alerts
- **General 'pull' Technologies** formatted for mobile
  - Web, RSS, etc

Future Plans

iNWS is still EXPERIMENTAL!

- Seeking NWS Corporate Board approval; national implementation
- Additional development planned
  - Add HYSPLIT data (hazardous plume trajectory/dispersion)
  - Add Hydrologic data (river gauge observations, hydrographs)
  - Add support for more mobile platforms
- Integrate with DHS/FEMA CMAS system when available
- Work with core partners to ensure effective use
- Listen to (and act on) user feedback!

Lessons Learned

- Focus on core partners as your target audience
- Apply “what you do best” to extend your mission into the mobile market
- Provide differentiation between public and private roles for mobile services. (Boundary based on service mission, rather than arbitrary technology)

- Leverage SMS Brokers for liaison to Cell Service Providers
- Select a small set of mobile platforms to begin development on
- Utilize open source/open standards to avoid vendor-licensing costs

- Until mobile vendors unlock Locator API’s, let the user provide location information
- Account for range of services (text-only, web-based, and java-based)
- Don’t forget about security (mobile firewalls, passwords, data storage)
- Scale: Buy the biggest SMS contract you can afford!

In Summary

It is vital for US Government agencies
to remain technically relevant
in today's mobile information society

The public is going mobile, are you?

Thank you. Questions?

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